CLAIMS

I claim:

1.   A method for color quantization of an image, comprising:

mapping pixels of an image into corresponding color space regions;

determining whether said corresponding color space regions are linked to a color map; and

if individual of said corresponding color space regions are not linked to said color map, then linking said individual of said corresponding color space regions to said color map where color map linkages are available, or determining color space regions that are linked to said color map and having associated colors closest to colors of the pixels of said individual of said corresponding color space regions where color map linkages are not available.

2.   The method according to claim 1, wherein said mapping pixels of an image into corresponding color space regions, comprises:

defining a plurality of color space regions in a 3-dimensional color space; and

determining which of said plurality of color space regions each pixel of said image maps according to a color of said pixel.

3.   The method according to claim 2, wherein said plurality of color space regions is formed by segmenting each axis of said 3-dimensional color space into a plurality of segments.

4.   The method according to claim 3, wherein said 3-dimensional color space has a red axis segmented into eight segments, a green axis segmented into eight segments and a blue axis segmented into eight segments so that a number of said plurality of color space regions is 512.

5.   The method according to claim 4, wherein said plurality of color space regions are uniformly sized.

6.   The method according to claim 4, wherein said plurality of color space regions are non-uniformly sized.

7.   The method according to claim 1, wherein said determining whether said corresponding color space regions are linked to a color map, comprises:

reading records associated with said corresponding color space regions; and

determining whether said corresponding color space regions are linked to said color map by a use indication in said records.

8. The method according to claim 1, wherein said linking said individual of said corresponding color space regions to said color map where color map linkages are available, comprises:

determining whether color map linkages are available for said color map; and

updating records of said individual of said corresponding color space regions so as to indicate that they are linked to said color map until either all of said records have been so updated or no more color map linkages are available.

9. The method according to claim 1, wherein said determining color space regions that are linked to said color map and having associated colors closest to colors of the pixels of said individual of said corresponding color space regions where color map linkages are not available, comprises:

determining associated colors for color space regions linked to said color map; and

determining which of said associated colors for color space regions linked to said color map are closest to the colors of the pixels of said individual of said corresponding color space regions.

10. The method according to claim 9, wherein said determining associated colors for color space regions linked to said color map, comprises determining for individual of said color space regions linked to said color

map, an average color of pixels mapped into the color space region.

11. The method according to claim 1, further comprising:

if individual of said corresponding color space regions are linked to said color map, then reading information of color map linkages stored in records associated with such individual of said corresponding color space regions, and storing said information of color map linkages along with information of the pixels of such individual of said corresponding color space regions.

12. The method according to claim 1, wherein said linking said individual of said corresponding color space regions to said color map where color map linkages are available, further comprises reading information of color map linkages stored in records associated with said individual of said corresponding color space regions, and storing said information of color map linkages read from said records along with information of the pixels of such individual of said corresponding color space regions.

13. The method according to claim 1, further comprising:

if individual of said corresponding color space regions are not linked to said color map, then information of color map linkages read from records of color space regions that are linked to said color map and having

associated colors closest to colors of the pixels of said individual of said corresponding color space regions are stored along with information of such individual of said corresponding color space regions.

14. An apparatus for color quantization of an image, comprising at least one circuit configured to:

map pixels of an image into corresponding color space regions;

determine whether said corresponding color space regions are linked to a color map; and

if individual of said corresponding color space regions are not linked to said color map, then link said individual of said corresponding color space regions to said color map where color map linkages are available, or determine color space regions that are linked to said color map and having associated colors closest to colors of the pixels of said individual of said corresponding color space regions where color map linkages are not available.

15. The apparatus according to claim 14, wherein said at least one circuit is further configured to:

if individual of said corresponding color space regions are linked to said color map, then read information of color map linkages stored in records associated with such individual of said corresponding color space regions, and store said information of color map linkages along with information of the pixels of such individual of said corresponding color space regions.

16. The apparatus according to claim 14, wherein said at least one circuit is further configured to:

if individual of said corresponding color space regions are not linked to said color map, then store information of color map linkages read from records of color space regions that are linked to said color map and having associated colors closest to colors of the pixels of said individual of said corresponding color space regions along with information of such individual of said corresponding color space regions.

17. The apparatus according to claim 14, wherein said at least one circuit includes a processor that is configured by programming said processor.

18. The apparatus according to claim 14, wherein said at least one circuit includes at least one logic circuit.

19. A method for generating a dynamic color map for color quantization of images, comprising:

mapping each pixel of an image into one of a plurality of color space regions;

generating a count of pixels mapped into each of said plurality of color space regions; and

generating a dynamic color map by including associated colors of color space regions having largest non-zero of such generated counts up to a maximum number

that is less than or equal to a number of said plurality of color space regions.

20. The method according to claim 19, further comprising:

mapping each pixel of a subsequent image into one of said plurality of color space regions;

generating an updated count of pixels mapped into each of said plurality of color space regions; and

updating said dynamic color map by including associated colors of color space regions having largest non-zero of such generated updated counts up to said maximum number, and reserving any remainder up to said maximum number for another at least one subsequent image.

21. The method according to claim 20, wherein said number of said plurality of color space regions is equal to 512, and said maximum number of associated colors is equal to 256.

22. The method according to claim 21, wherein said plurality of color space regions are organized into eight segments of red, eight segments of green, and eight segments of blue.

23. The method according to claim 22, wherein said plurality of color space regions are uniformly sized with said eight segments of red, said eight segments of

green, and said eight segments of blue segmented on a linear scale.

24. The method according to claim 22, wherein said plurality of color space regions are non-uniformly sized with said eight segments of red, said eight segments of green, and said eight segments of blue segmented on a non-linear scale.

25. The method according to claim 19, further comprising:

generating a sum of red values of such pixels for individual of said plurality of color spaces;

generating a sum of green values of such pixels for individual of said plurality of color spaces;

generating a sum of blue values of such pixels for individual of said plurality of color spaces; and

generating an average color of such pixels for individual of said plurality of color spaces by dividing said sum of red values by said count, said sum of green values by said count, and said sum of blue values by said count for said individual of said plurality of color spaces.

26. An apparatus for generating a dynamic color map for color quantization of images, comprising at least one circuit configured to:

map each pixel of an image into one of a plurality of color space regions;

generate a count of pixels mapped into each of said plurality of color space regions; and

generate a dynamic color map by including associated colors of color space regions having largest non-zero of such generated counts up to a maximum number that is less than a number of said plurality of color space regions.

27. The apparatus according to claim 26, wherein said at least one circuit is further configured to:

map each pixel of a subsequent image into one of said plurality of color space regions;

generate an updated count of pixels mapped into each of said plurality of color space regions; and

update said dynamic color map by including associated colors of color space regions having largest non-zero of such generated updated counts up to said maximum number.

28. The apparatus according to claim 27, wherein said plurality of color spaces are organized into eight segments of red, eight segments of green, and eight segments of blue.

29. The apparatus according to claim 28, wherein said maximum number of color spaces equals 256.

30. The apparatus according to claim 28, wherein said plurality of color spaces are uniformly sized with said eight segments of red, said eight segments of green, and said eight segments of blue segmented on a linear scale.

31. The apparatus according to claim 28, wherein said plurality of color spaces are non-uniformly sized with said eight segments of red, said eight segments of green, and said eight segments of blue segmented on a non-linear scale.

32. The apparatus according to claim 26, wherein said at least one circuit is further configured to:

generate a sum of red values of such pixels for individual of said plurality of color spaces;

generate a sum of green values of such pixels for individual of said plurality of color spaces;

generate a sum of blue values of such pixels for individual of said plurality of color spaces; and

generate an average color of such pixels for individual of said plurality of color spaces by dividing said sum of red values by said count, said sum of green values by said count, and said sum of blue values by said count for said individual of said plurality of color spaces.

33. The apparatus according to claim 26, wherein said at least one circuit is a processor configured by being programmed.

34. The apparatus according to claim 26, wherein said at least one circuit comprises logic circuitry.

35. An apparatus for generating a dynamic color map for color quantization of images, comprising:

means for associating each pixel of an image with a corresponding one of a plurality of color spaces;

means for generating a count of such pixels for individual of said plurality of color spaces; and

means for generating a dynamic color map by including color spaces having largest and non-zero of such counts up to a maximum number of color spaces, and reserving a first remainder of said maximum number of color spaces for at least a second image.

36. The apparatus according to claim 35, further comprising:

means for associating each pixel of said second image with a corresponding one of said plurality of color spaces;

means for generating an updated count of such pixels for individual of said plurality of color spaces; and

means for generating an updated dynamic color map by including color spaces having largest and non-zero of such updated counts up to said maximum number of color spaces.

37.   The apparatus according to claim 36, wherein said plurality of color spaces are organized into eight segments of red, eight segments of green, and eight segments of blue.

38.   The apparatus according to claim 37, wherein said maximum number of color spaces equals 256.